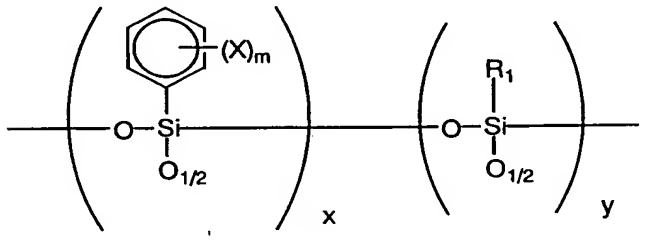
WHAT IS CLAIMED IS:

1. A photosensitive composition for optical waveguides comprising an organic oligomer, a polymerization initiator and a crosslinking agent, said organic oligomer being a silicone oligomer represented by the following formula (1):



(1)

wherein X denotes hydrogen, deuterium, halogen, an alkyl group or an alkoxy group; m is an integer from 1 to 5; x and y designate the proportion of respective units, and neither x nor y is 0; and R_1 denotes a methyl, ethyl, or isopropyl group.

2. The photosensitive composition for optical waveguides as claimed in Claim 1, wherein said photosensitive composition for optical waveguides is cationic photopolymerizable, and said crosslinking agent capable of greatly activating photopolymerizability of said silicone oligomer as a main component of said composition has at least an epoxy moiety or an alkoxysilane moiety in the molecule.

3. A method of producing said photosensitive composition for optical waveguides as claimed in Claim 1, said method comprising the steps of:

heating a silicone oligomer and a crosslinking agent in the presence of a solid catalyst; and

filtering said solid catalyst, concentrating filtrate, and further adding a polymerization initiator.

4. A method of forming a polymer optical waveguide pattern, comprising the steps of:

applying and drying a photosensitive composition for optical waveguides;

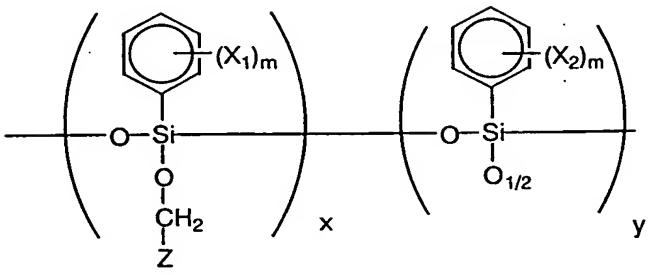
irradiating said resultant photosensitive composition thin film for optical waveguides with light through a mask; and

directly forming a core-ridge pattern by wet etching said photosensitive composition thin film;

wherein the photosensitive composition for optical waveguides as claimed in Claim 1 is used as said photosensitive composition for optical waveguides.

5. A photosensitive composition for optical waveguides comprising an organic oligomer and a polymerization initiator, said organic oligomer being

a silicone oligomer represented by the following formula (2):



(2)

wherein X_1 and X_2 may be the same as or different from each other, and denote hydrogen, deuterium, halogen, an alkyl group or an alkoxy group; m is an integer from 1 to 5; and Z denotes an epoxy group shown in the following formula (I) or (II):

(I)

(II)

wherein x and y designate the proportion of respective units, and y is smaller than x and may be 0.

6. A method of producing said photosensitive composition for optical waveguides as claimed in Claim 5, said method comprising the steps of:

heating a silicone oligomer in the presence of a solid catalyst; and

filtering said solid catalyst, concentrating

filtrate, and further adding a polymerization initiator.

7. A method of forming a polymer optical waveguide pattern, comprising the steps of:

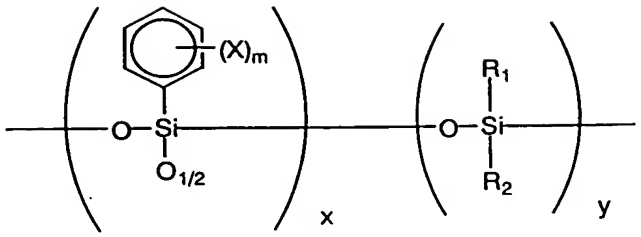
applying and drying a photosensitive composition for optical waveguides;

irradiating said resultant photosensitive composition thin film for optical waveguides with light through a mask; and

directly forming a core-ridge pattern by wet etching said photosensitive composition thin film;

wherein the photosensitive composition for optical waveguides as claimed in Claim 5 is used as said photosensitive composition for optical waveguides.

8. A photosensitive composition for optical waveguides comprising an organic oligomer, a polymerization initiator and a crosslinking agent, said organic oligomer being a silicone oligomer represented by the following formula (3):



(3)

wherein X denotes hydrogen, deuterium, halogen, an alkyl group or an alkoxy group; m is an integer from 1 to 5; x and y designate the proportion of respective units, and neither x nor y is 0; and R_1 and R_2 may be the same as or different from each other, and denote a methyl, ethyl, or isopropyl group.

9. The photosensitive composition for optical waveguides as claimed in Claim 8, wherein said photosensitive composition for optical waveguides is cationic photopolymerizable, and said crosslinking agent capable of greatly activating photopolymerizability of said silicone oligomer as a main component of said composition has at least an epoxy moiety or an alkoxysilane moiety in the molecule.

10. A method of producing said photosensitive composition for optical waveguides as claimed in Claim 8, said method comprising the steps of:

heating a silicone oligomer and a crosslinking agent in the presence of a solid catalyst; and

filtering said solid catalyst, concentrating

filtrate, and further adding a polymerization initiator.

11. A method of forming a polymer optical waveguide pattern, comprising the steps of:

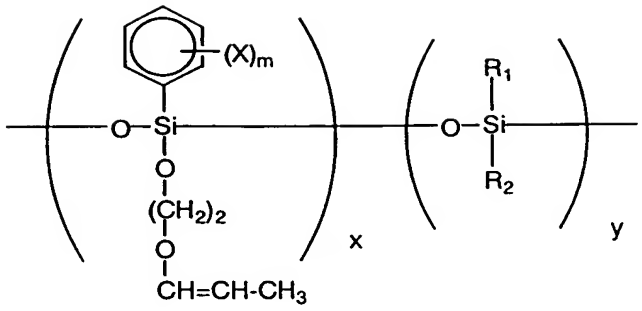
applying and drying a photosensitive composition for optical waveguides;

irradiating said resultant photosensitive composition thin film for optical waveguides with light through a mask; and

directly forming a core-ridge pattern by wet etching said photosensitive composition thin film;

wherein the photosensitive composition for optical waveguides as claimed in Claim 8 is used as said photosensitive composition for optical waveguides.

12. A photosensitive composition for optical waveguides comprising an organic oligomer and a polymerization initiator, said organic oligomer being a silicone oligomer represented by the following formula (4):



(4)

wherein X denotes hydrogen, deuterium, halogen, an alkyl group or an alkoxy group; m is an integer from 1 to 5; x and y designate the proportion of respective units, and neither x nor y is 0; and R_1 and R_2 may be the same as or different from each other and denote a methyl, ethyl, or isopropyl group.

13. A method of producing said photosensitive composition for optical waveguides as claimed in Claim 12, said method comprising the steps of:

heating a silicone oligomer in the presence of a solid catalyst; and

filtering said solid catalyst, concentrating filtrate, and further adding a polymerization initiator.

14. A method of forming a polymer optical waveguide pattern, comprising the steps of:

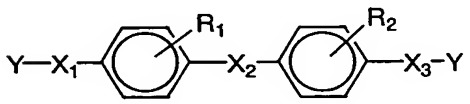
applying and drying a photosensitive composition for optical waveguides;

irradiating said resultant photosensitive composition thin film for optical waveguides with light through a mask; and

directly forming a core-ridge pattern by wet etching said photosensitive composition thin film;

wherein the photosensitive composition for optical waveguides as claimed in Claim 12 is used as said photosensitive composition for optical waveguides.

15. A photosensitive composition for optical waveguides comprising an organic oligomer and a polymerization initiator, said organic oligomer being an oligomer represented by the following formula (5):



(5)

wherein R_1 and R_2 may be the same as or different from each other, and denote hydrogen, halogen, an alkyl group, an alkoxy group or a trifluoromethyl group; X_1, X_2 and X_3 may be the same as or different from each other, and denote a connection group including at least one selected from the group consisting of an alkylene, alkyleneoxy, oxyalkylene and aromatic group; and Y denotes a polymerization activating group.

16. A method of producing said photosensitive composition for optical waveguides as claimed in Claim 15, said method comprising the steps of:

heating a silicone oligomer in the presence of a solid catalyst; and

filtering said solid catalyst, concentrating filtrate, and further adding a polymerization initiator.

17. A method of forming a polymer optical waveguide pattern, comprising the steps of:

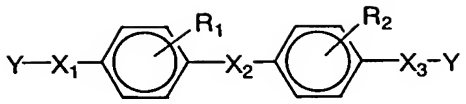
applying and drying a photosensitive composition for optical waveguides;

irradiating said resultant photosensitive composition thin film for optical waveguides with light through a mask; and

directly forming a core-ridge pattern by wet etching said photosensitive composition thin film;

wherein the photosensitive composition for optical waveguides as claimed in Claim 15 is used as said photosensitive composition for optical waveguides.

18. A photosensitive composition for optical waveguides comprising an organic oligomer and a polymerization initiator, said organic oligomer being an oligomer represented by the following formula (6):



(6)

wherein R_1 and R_2 may be the same as or different from each other, and denote hydrogen, halogen, an alkyl group, an alkoxy group or a trifluoromethyl group; X_1, X_2 and X_3 may be the same as or different from each other, and denote a connection group including at least one selected from the group consisting of an alkylene, alkyleneoxy, oxyalkylene and aromatic group, and including at least one OH group; and Y denotes a polymerization activating group.

19. A method of producing the photosensitive composition for optical waveguides as claimed in Claim 18, said method comprising the steps of:

heating a silicone oligomer in the presence of a solid catalyst; and

filtering said solid catalyst, concentrating filtrate, and further adding a polymerization initiator.

20. A method of forming a polymer optical waveguide pattern, comprising the steps of:

applying and drying a photosensitive composition for optical waveguides;

irradiating said resultant photosensitive composition thin film for optical waveguides with light through a mask; and

directly forming a core-ridge pattern by wet etching said photosensitive composition thin film;

wherein the photosensitive composition for optical waveguides as claimed in Claim 18 is used as said photosensitive composition for optical waveguides.